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The Orion Atmosphere Revitalization Technology in Manned Ambient Pressure Space Suit Testing

Abstract

An amine-based carbon dioxide (CO₂) and water vapor sorbent in pressure-swing regenerable beds has been developed by Hamilton Sundstrand and baselined for the Atmosphere Revitalization System (ARS) for moderate duration missions of the Orion Multipurpose Crew Vehicle. The Orion ARS is designed to support not only open-cabin operations, tests of which have been reported in previous years at this conference, but also closed space suit-loop operations. A previous low-pressure suit loop test was performed with a human metabolic simulator, and humans wearing emergency masks were tested in a closed-loop configuration before that. In late 2011, simple tests were performed in a suit-loop configuration with human test subjects in prototype space suits with prototype umbilicals at ambient and two slightly above-ambient pressures. Trace contaminant filters and a prototype blower were also incorporated into the test rig. This paper discusses the performance of the ARS technology in that 2011 test configuration.